Art. XI.—*On the supposed Intra-Mercurial Planet.*

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[Read 14th November, 1878.]

The announcement that during the total eclipse of the 29th July last, visible in the United States of America, Professor Watson had discovered an unknown body near the sun, supposed to be an intra-mercurial planet, has revived the almost dormant question of the existence of such a body, and awakened fresh interest in the earlier observations of the supposed planet Vulcan. It will be known to some of you, no doubt, that long since, the celebrated Leverrier demonstrated that Mercury's perihelion moved 40 seconds per century faster than it should do, taking into account the gravitating action of only the known planets of the system. This he most easily accounted for by supposing that there were between Mercury and the sun a group of small planets. Adopting this theory, various recorded observations of the passage across the sun's disc of dark round bodies, at a more rapid rate than ordinary sun spots, were adduced as evidence of the existence of such planets; but the untrustworthiness of some of these observations, and the failure of experienced observers to detect the phenomena while scrutinising the sun's surface at the very times the reputed passages occurred, has hitherto so weakened the only proofs adduced—except the theoretical one of Leverrier's—that he alone, I believe, out of all experienced astronomers, still had strong faith that intra-mercurial planets or a planet would yet be discovered. On March 21st, 1877, a transit of the supposed body across the sun's disc was announced as probable by Leverrier, and a systematic search was kept up by all the principal observatories of the world during the days indicated, but nothing was discovered. The American astronomers, probably made more sanguine by the recent discovery by one of them of the satellites of Mars, seized the opportunity of the late eclipse for examining systematically the immediate vicinity of the sun during the moments of totality, at which times it is possible to detect comparatively small stars very close to him, except in the rays of the corona.

Professor Watson, a well-known and experienced astronomer, who observed the eclipse at Rawlins, Wy., devoted himself to this work, and by help of specially contrived and extemporised accessories to his equatorial, made a methodical search, which according to accounts already to hand appears to have been, in some degree at least, successful. The first announcement that Professor Watson had discovered Vulcan was received with incredulity, and our veteran English Astronomer Royal thought it highly probable that *θ Cancri* had been mistaken for the sought-for planet; you will remember also I stated at a former meeting that although the discovery of an intra-mercurial planet had been notified, it was not by any means received by astronomers as established. More recent advices, however, add considerably to the probabilities that Professor Watson has actually discovered a planet moving inside the orbit of Mercury. The chart shown will give you an idea of the position of the body, as well as that of *θ Cancri* when observed, which at once disposes of Sir George Airy's suggestion that that star had been mistaken for a planet. Professor Watson says "that while searching with his specially-fitted telescope he came across *a ruddy star of the four and a-half magnitude which had a perceptible disc,* the magnifying power being only 45." He says also "it was much brighter than *θ Cancri,*" which is the fifth magnitude. It has been suggested that the object seen might have been a comet, but Professor Watson specially remarks that "there was no appearance such as would be expected if it had been a comet;" and further, that he feels warranted in believing it to be an *intra-mercurial planet.* Although I do not think this observation alone will establish the existence of a new planet beyond all doubt, it at all events makes it highly probable, and will stimulate astronomers to avail themselves of every possible chance of ratifying Professor Watson's observation. A Mr. Swift, a well-known American observer of comets, also saw a "strange star," and although the positions he gives do not quite agree with those of Professor Watson, his observation is admitted to be in a great measure corroborative. It is pointed out in *Nature,* No. 463, that a search along the Ecliptic within 10° or 12° each side of the sun with large refractors provided with long *dew caps, blackened inside,* will afford the best and probably only chance of recovering Professor Watson's planet, until the total eclipse of 1882.